

## **Amendments to the Claims**

Please amend the claims without prejudice, such that this listing of claims will replace all prior versions, and listings, of claims in the application.

### Listing of Claims

1. (original) A method for reducing the interfering effect of a radar transmitter occupying a nominal frequency bandwidth into an other operating band, where said other operating band is spaced from said nominal frequency bandwidth by a third frequency band, said method comprising the steps of:

generating at said radar transmitter a constant-amplitude pulse centered at a frequency within said nominal frequency bandwidth of said radar and having a nominal bandwidth which lies within said nominal frequency bandwidth, and which also has an actual bandwidth which extends into said other operating band;

applying phase perturbations to said constant-amplitude pulse so as to produce a phase-perturbed constant-amplitude pulse centered at said frequency within said nominal frequency bandwidth of said radar with reduced amplitude of that portion of said actual bandwidth of said constant-amplitude pulse which lies within said other operating band; and

transmitting said phase-perturbed constant-amplitude pulse toward a radar target.

2. (original) A method for reducing interference between constant-amplitude long-range and short-range radar subpulses, where said long-range radar subpulses are centered at a first frequency and have a first nominal passband and said short-range pulses are centered at a second frequency, different from said first frequency and having a second nominal passband, the passband of at least one of said long-range and short-range radar subpulses extending at least partially into said nominal passband of the other of said long-range and short-range radar subpulses, said method comprising the steps of:

selectively applying phase perturbations to said one of said long-range and short-range radar subpulses to tend to null that portion of said passband of said one of said

long-range and short-range radar subpulses which extends into said nominal passband of said other one of said long-range and short-range radar subpulses.

3. (original) A method according to claim 2, wherein said step of selectively applying phase perturbations includes the steps of:

(a) Compute  $s_k$ , the nominal pulse's  $k^{\text{th}}$  digital sample as:

$$s_k = \cos ( 2\pi ( f_0 / f_s ) k + \theta_k )$$

where:

$k$  is a sample index ranging between 1 and  $N$ , the total number of samples in the net pulse;

$f_0$  is the pulse's center frequency at the input to the digital-to-analog (D/A) converter;

$f_s$  is the sample rate at which the signal samples are to be read out of a digital memory (and the same rate at which the D/A converter operates); and

$\theta_k$  is the pulse's nominal phase modulation function;

(b) compute the phase perturbation as:

$$\phi = \lambda [\lambda \mathbf{D} \mathbf{R} \mathbf{D} + \mathbf{I}]^{-1} \mathbf{D} \mathbf{R} \mathbf{s}$$

where:

$\phi$  is an  $N \times 1$  column vector of phase perturbation samples with  $k^{\text{th}}$  element equal to  $\phi_k$ ;

$\lambda$  is a positive scalar, greater than unity, whose value determines null depth;

$\mathbf{D}$  is an  $N \times N$  diagonal matrix (all off-diagonal elements are zero) whose  $k^{\text{th}}$  diagonal element is similar to  $s_k$  with the cosine function replaced by the sine;

$\mathbf{R}$  is an  $N \times N$  matrix that determines null center frequency, width, and shape;

$\mathbf{I}$  is an  $N \times N$  identity matrix; and

$\mathbf{s}$  is an  $N \times 1$  vector whose  $k^{\text{th}}$  element is equal to  $s_k$ , to thereby define a  $k^{\text{th}}$  signal sample as

$$\tilde{s}_k = \cos ( 2\pi ( f_0 / f_s ) k + \theta_k + \phi_k )$$

where the tilde indicates a sample of the phase-perturbed pulse and  $\phi_k$  is the  $k^{\text{th}}$  sample of the phase perturbation that creates the desired spectral null.

4. (new) A method of transmitting a radar pulse, comprising the steps of:  
generating a constant-amplitude pulse centered at a center frequency and having an actual bandwidth which includes a selected frequency range;

applying phase perturbations to said constant-amplitude pulse so as to produce a phase-perturbed constant-amplitude pulse centered at said center frequency with reduced amplitude in said selected frequency range and relatively higher amplitudes above and below said selected frequency range; and

transmitting said phase-perturbed constant-amplitude pulse toward a radar target.

5. (new) The method of claim 4, wherein the phase perturbations are based in part on a null depth factor, a value of said null depth factor determining the reduced amplitude.

6. (new) The method of claim 4, wherein the phase perturbations are based in part on a null center factor, a value of said null center factor determining at least one of frequency, width and shape of said pulse in said selected frequency range.